

## 3.2 Using Parallel Lines and Transversals

## Questions:

1. Name a pair of corresponding angles. \_\_\_\_\_
- a. What is the relationship between their measurements?  $\cong$
2. Name a pair of alternate interior angles. \_\_\_\_\_
- a. What is the relationship between their measurements?  $\cong$
3. Name a pair of same-side interior (consecutive) angles. \_\_\_\_\_
- a. What is the relationship between their measurements? supplementary
4. Name a pair of alternate exterior angles. \_\_\_\_\_
- a. What is the relationship between their measurements?  $\cong$

## Conclusions:

## Postulate 15 Corresponding Angles Postulate

If two parallel lines are cut by a transversal, then each pair of corresponding angles is  $\cong$ .

## Theorem 3.1 Alternate Interior Angles Theorem

If two parallel lines are cut by a transversal, then each pair of alternate interior angles is  $\cong$ .

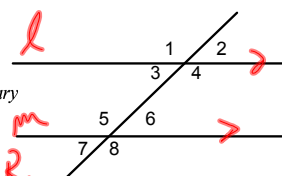
## Theorem 3.2 Alternate Exterior Angles Theorem

If two parallel lines are cut by a transversal, then each pair of alternate exterior angles is  $\cong$ .

## Theorem 3.3 Consecutive Interior Angles Theorem

If two parallel lines are cut by a transversal, then each pair of same-side (consecutive) interior angles is supplementary.

Let's prove Theorem 3.3

Given:  $l \parallel m$ Prove:  $\angle 3$  and  $\angle 5$  are supplementary

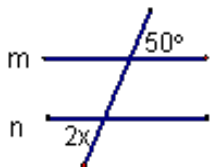
- S      R.
- |  |  |
|--|--|
| ① $l \parallel m$                      | ① Given  |
| ② $\angle 5$ and $\angle 6$ are a L.P. | ② def of Lin. Pair   |
| ③ $\angle 5$ and $\angle 6$ are suppl. | ③ L.P.P.   |
| ④ $m\angle 5 + m\angle 6 = 180$        | ④ def of suppl.  |
| ⑤ $m\angle 3 = m\angle 6$              | ⑤ Alt. Int $\angle$ s thm<br>(If $l \parallel$ , alt int $\cong$ ) |
| ⑥ $m\angle 5 + m\angle 3 = 180$        | ⑥ subst.   |
| ⑦ $\angle 3$ and $\angle 5$ are suppl. | ⑦ def of suppl.  |

Solve for x and/or y.

$$m \parallel n$$

$$2x = 50$$

$$x = 25$$



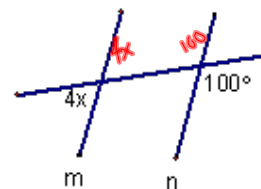
Solve for x and/or y.

$$m \parallel n$$

$$4x + 100 = 180$$

$$4x = 80$$

$$x = 20$$



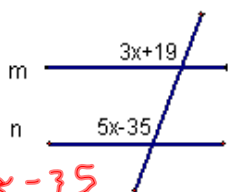
Solve for x and/or y.

$$m \parallel n$$

$$3x + 19 = 5x - 35$$

$$54 = 2x$$

$$27 = x$$



Solve for x and/or y.

$$m \parallel n$$

$$x + 8 + 6x - 52 = 180$$

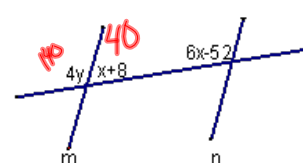
$$7x - 44 = 180$$

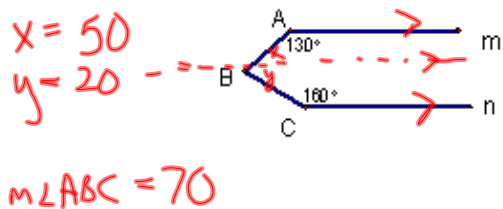
$$7x = 224$$

$$x = 32$$

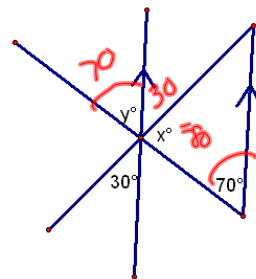
$$4y = 140$$

$$y = 35$$

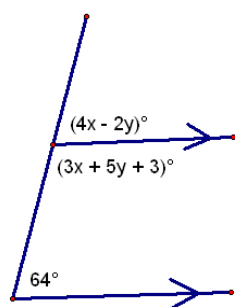


Find the  $m\angle ABC$  $m \parallel n$ 

Solve for x and/or y.



Solve for x and/or y.



HW  
p.158 #s 27-32, 35, 36